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ATTACHMENT TO AMENDMENT A

"AIM STANDARD USD-6"

AIM
AUTOMATIC IDENTIFICATION MANUFACTURERS

USD-6

AUTOMATIC IDENTIFICATION MANUFACTURERS UNIFORM SYMBOL DESCRIPTION—6 CODE 128

MHI
THE MATERIAL HANDLING INSTITUTE, INC.

8.0 **Dimensional Specifications**

CODE 128 is, independent of absolute dimensions beyond those required by the printing and reading devices chosen to print and read the symbols in any given application. The CODE is tolerant of ink spread and similar consistent dimensional errors normally encountered during the printing process.

Table II defines the acceptable printed symbol dimensional tolerances based on an absolute minimum bar or space dimension of 0.009 inches. A symbol meeting these tolerances can be printed and read by most currently available technologies. Larger minimum printed dimensions may be required for certain applications.

In Table II, the "x" dimension shown is the nominal dimension of one code bar or space element.

The Bar or Space tolerance, "b", is the maximum amount any Bar or Space width may vary from its nominal dimension.

The Edge to Edge Tolerance, "e" is the maximum amount any dimension measured from the leading edge of one bar to the leading edge of the following bar, or the trailing edge of one bar to the trailing edge of the following bar, may vary from its nominal dimension.

The Character to Character Pitch Tolerance, "p", is the maximum amount any dimension measured from the leading edge of the first bar of any character to the leading edge of the first bar of the following character may vary from its nominal dimension.

Table II

"X" Dimension	0.001 Inches		
	Bar or Space Tolerance ± "b"	Edge to Edge ± "e"	Character to Character ± "p"
10	1.00	1.44	2.90
11	2.00	1.60	3.19
12	3.00	1.76	3.48
13	3.97	1.91	3.77
14	4.42	2.06	4.06
15	4.89	2.20	4.35
16	5.36	2.35	4.64
17	5.83	2.50	4.93
18	6.30	2.64	5.22
19	6.77	2.79	5.51
20	7.24	2.94	5.80
21	7.71	3.09	6.09
22	8.18	3.23	6.38
23	8.65	3.38	6.67
24	9.12	3.53	6.96
25	9.59	3.67	7.25
26	10.06	3.82	7.54
30	11.70	4.41	8.70
40	15.60	5.88	11.60
50	19.50	7.35	14.50

Table I

CODE 128 (USD-6)

VALUE	CODE A	CODE B	CODE C	BAR PATTERN					
				B	S	B	S	B	S
0	SP	SP	00	2	1	2	2	2	2
1	!	!	01	2	2	2	1	2	2
2	"	"	02	2	2	2	2	2	1
3	#	#	03	1	2	1	2	2	3
4	$	$	04	1	2	1	3	2	2
5	%	%	05	1	3	1	2	2	2
6	&	&	06	1	2	2	2	1	3
7	'	'	07	1	2	2	3	1	2
8	(	(	08	1	3	2	2	1	2
9	)	)	09	2	2	1	2	1	3
10	*	*	10	2	2	1	3	1	2
11	+	+	11	2	3	1	2	1	2
12	,	,	12	1	1	2	2	3	2
13	—	—	13	1	2	2	1	3	2
14	.	.	14	1	2	2	2	3	1
15	/	/	15	1	1	3	2	2	2
16	0	0	16	1	2	3	1	2	2
17	1	1	17	1	2	3	2	2	1
18	2	2	18	2	2	3	2	1	1
19	3	3	19	2	2	1	1	3	2
20	4	4	20	2	2	1	2	3	1
21	5	5	21	2	1	3	2	1	2
22	6	6	22	2	2	3	1	1	2
23	7	7	23	3	1	2	1	3	1
24	8	8	24	3	1	1	2	2	2
25	9	9	25	3	2	1	1	2	2
26	:	:	26	3	2	1	2	2	1
27	;	;	27	3	1	2	2	1	2
28	<	<	28	3	2	2	1	1	2
29	=	=	29	3	2	2	2	1	1
30	>	>	30	2	1	2	1	2	3
31	?	?	31	2	1	2	3	2	1
32	@	@	32	2	3	2	1	2	1
33	A	A	33	1	1	1	3	2	3
34	B	B	34	1	3	1	1	2	3
35	C	C	35	1	3	1	3	2	1
36	D	D	36	1	1	2	3	1	3
37	E	E	37	1	3	2	1	1	3
38	F	F	38	1	3	2	3	1	1
39	G	G	39	2	1	1	3	1	3
40	H	H	40	2	3	1	1	1	3
41	I	I	41	2	3	1	3	1	1
42	J	J	42	1	1	2	1	3	3
43	K	K	43	1	1	2	3	3	1
44	L	L	44	1	3	2	1	3	1
45	M	M	45	1	1	3	1	2	3
46	N	N	46	1	1	3	3	2	1
47	O	O	47	1	3	3	1	2	1
48	P	P	48	3	1	3	1	2	1
49	Q	Q	49	2	1	1	3	3	1
50	R	R	50	2	3	1	1	3	1
51	S	S	51	2	1	3	1	1	3
52	T	T	52	2	1	3	3	1	1
53	U	U	53	2	1	3	1	3	1
54	V	V	54	3	1	1	1	2	3
55	W	W	55	3	1	1	3	2	1
56	X	X	56	3	3	1	1	2	1
57	Y	Y	57	3	1	2	1	1	3
58	Z	Z	58	3	1	2	3	1	1
59	[	[	59	3	3	2	1	1	1

VALUE	CODE A	CODE B	CODE C	BAR PATTERN					
				B	S	B	S	B	S
60	\	\	60	3	1	4	1	1	1
61	]	]	61	2	2	1	4	1	1
62	^	^	62	4	3	1	1	1	1
63	_	_	63	1	1	1	2	2	4
64	NUL	`	64	1	1	1	4	2	2
65	SOH	a	65	1	2	1	1	2	4
66	STX	b	66	1	2	1	4	2	1
67	ETX	c	67	1	4	1	1	2	2
68	EOT	d	68	1	4	1	2	2	1
69	ENQ	e	69	1	1	2	2	1	4
70	ACK	f	70	1	1	2	4	1	2
71	BEL	g	71	1	2	2	1	1	4
72	BS	h	72	1	2	2	4	1	1
73	HT	i	73	1	4	2	1	1	2
74	LF	j	74	1	4	2	2	1	1
75	VT	k	75	2	4	1	2	1	1
76	FF	l	76	2	2	1	1	1	4
77	CR	m	77	4	1	3	1	1	1
78	SO	n	78	2	4	1	1	1	2
79	SI	o	79	1	3	4	1	1	1
80	DLE	p	80	1	1	1	2	4	2
81	DC1	q	81	1	2	1	1	4	2
82	DC2	r	82	1	2	1	2	4	1
83	DC3	s	83	1	1	4	2	1	2
84	DC4	t	84	1	2	4	1	1	2
85	NAK	u	85	1	2	4	2	1	1
86	SYN	v	86	4	1	1	2	1	2
87	ETB	w	87	4	2	1	1	1	2
88	CAN	x	88	4	2	1	2	1	1
89	EM	y	89	2	1	2	1	4	1
90	SUB	z	90	2	1	4	1	2	1
91	ESC	{	91	4	1	2	1	2	1
92	FS	|	92	1	1	1	1	4	3
93	GS	}	93	1	1	1	3	4	1
94	RS	~	94	1	3	1	1	4	1
95	US	DEL	95	1	1	4	1	1	3
96	FNC 3	FNC 3	96	1	1	4	3	1	1
97	FNC 2	FNC 2	97	4	1	1	1	1	3
98	SHIFT	SHIFT	98	4	1	1	3	1	1
99	CODE C	CODE C	99	1	1	3	1	4	1
100	CODE B	FNC 4	CODE B	1	1	4	1	3	1
101	FNC 4	CODE A	CODE A	3	1	1	1	4	1
102	FNC 1	FNC 1	FNC 1	4	1	1	1	3	1

			B	S	B	S	B	S
103	START (CODE A)		2	1	1	4	1	2
104	START (CODE B)		2	1	1	2	1	4
105	START (CODE C)		2	1	1	2	3	2

		B	S	B	S	B	S	B
STOP		2	3	3	1	1	1	2

2.3 **Code Structure (Table I)**
CODE 128 has three unique Subsets shown in Table I as Code A, B, and C. The Bar and Space patterns shown are applicable to their equivalent characters listed under columns for Code A, B, or C, depending on which of the three unique Start Characters is used. If the symbol begins with Start Character A, then Code A Subset is defined. Code B or C Subsets are similarly defined by beginning the Symbol with Start Character B or C.

2.3.1 Code Subset A includes all of the standard alphanumeric keyboard characters plus control and special characters.

2.3.2 Code Subset B includes all of the standard alphanumeric keyboard characters plus lower case alpha and special characters.

2.3.3 Code Subset C includes a set of 100 digit pairs from 00 to 99 inclusive, allowing definition of double density numeric digits per character, plus special characters.

2.3.4 **Special Characters**
The last seven characters of Code Subsets A and B and the last three characters of Code Subset C are special characters that define special operations to the code reading device.

Within a symbol, it is possible to change from one Code Subset to another. The CODE and SHIFT special characters allow this type of change. The CODE Characters allow a Code Subset shift for all characters following it in the symbol. The SHIFT character allows a Code Subset shift for one character only. FNC or Function Characters define instructions to the Code Reading Device to allow for special operations, special applications, and/or future definitions.

2.3.4.1 **CODE Characters**
CODE A, B, or C Characters change the Symbol Code Subset from the Subset defined previously to the new Code Subset defined by the special Code Character. This change is applicable for all characters following that special Code Character until either the end of the symbol or the next special CODE A, B, or C Character is encountered.

2.3.4.2 **SHIFT Character**
The SHIFT Character changes the Code Subset from A to B or B to A for the single character following the SHIFT Character only.

2.3.4.3 **FNC Characters**
FNC 1—Reserved for future or special application
FNC 2—Special Instruction for Code Reader to temporarily store data from the symbol containing the FNC 2 character and transmit it with the next symbol data
FNC 3—Reserved for Code Reader initialization and other Code Reader specific operations
FNC 4—Reserved for future or special application

2.3.4.4 Note that none of the special characters (CODE, SHIFT, or FNC) as well as the Start, Stop or Check Characters, are to be displayed or transmitted by the Code Reader.

2.3.5 **Value**
Each character has associated with it a value listed in Table I. This value is used in calculating the Check Character for each symbol.

3.0 **Quiet Zone (Figure 1)**
The Quiet Zone is an area that is clear and free of all printing preceding the Start Character and following the Stop Character. The minimum Quiet Zone dimension is ten times (10X) the nominal element x.

4.0 **Wide to Narrow Ratio**
Not Applicable

5.0 **Intercharacter Gap**
Not Applicable

6.0 **Check Character (Figure 1)**
The character immediately preceding the STOP Character is the Check Character. The Check Character is a Modulus 103 Checksum that can be calculated by summing the start code value plus the products of each character position (most significant character position = 1) and the character value of that position. Divide the sum of the start code value and the products by 103. The remainder of the answer is the Check Character, expressed as the value of the encoded Check Character.

$$\frac{\text{Start Code Value} + \sum_{\text{Position}=1}^{n} (\text{Position})(\text{Position Value})}{103} = \begin{matrix}\text{Answer} + \\ \text{Remainder,} \\ \text{Remainder} = \\ \text{Check Character} \\ \text{Value}\end{matrix}$$

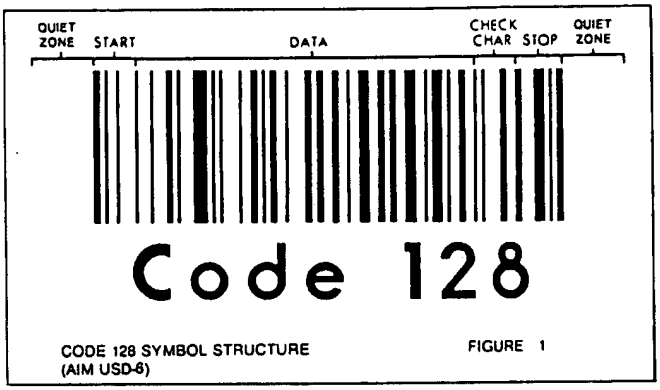
Every encoded character is included in the calculation with the exception of the Stop and Check Characters.

7.0 **Characters per Symbol**
Variable length symbols may be encoded.

AUTOMATIC IDENTIFICATION MANUFACTURERS UNIFORM SYMBOL DESCRIPTION—6 CODE 128

1.0 Introduction

CODE 128 (USD-6) is a bar code symbol whose name defines its capability of encoding the full ASCII 128 character set. CODE 128 is evolutionary in its ability to encode all the characters currently encodable in the various code formats existing today. The symbol is also revolutionary in its ability to encode those characters using fewer code elements per character resulting in a more compact code. It features unique start and stop characters for bidirectional and variable length decoding, both bar and space character parity for character integrity, a check character for symbol integrity, a function character for symbol linking, and spare function characters for unique application definition and/or future expansion.



CODE 128 SYMBOL STRUCTURE (AIM USD-6) FIGURE 1

CODE 128 is easily printed by conventional methods and its character assembly by discrete elements makes it especially suitable for computer plotted artwork and the latest computer controlled printing techniques by dot matrix, ink jet, and laser.

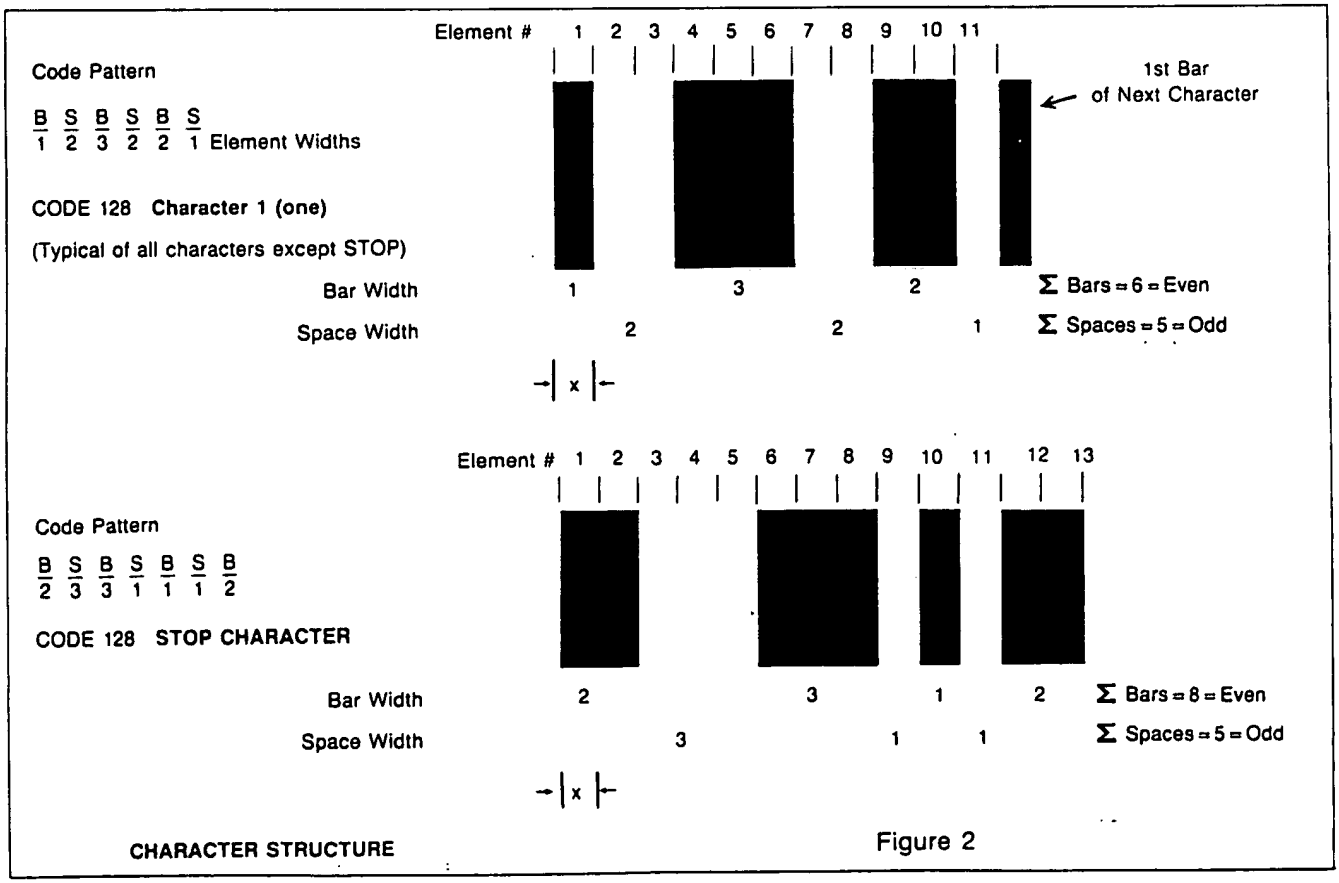
2.0 Symbol Encodation

2.1 Symbol Structure (Figure 1)

Each CODE 128 Symbol consists of a series of bar coded characters framed by non-printed areas called Quiet Zones. The bar coded character series begins with a unique start character, followed by the data characters with the most significant adjacent to the start character, then the check character, and finally the unique stop character. Human-readable information may be printed anywhere outside of the symbol area.

2.2 Character Structure (Figure 2)

Each CODE 128 character consists of eleven elements. Each element, whose width is a dimension called "x", can be either printed as a bar or part of a bar, or not printed and therefore a space or part of a space. Each character is comprised of three bars and three spaces, with each bar or space containing one to four elements. Character parity is defined by the sum of the printed elements in any character being even and the sum of the non-printed elements in any character being odd. This description applies to all CODE 128 characters except the STOP character, which differs with thirteen elements comprised of four bars and three spaces.



CHARACTER STRUCTURE Figure 2

AUTOMATIC
IDENTIFICATION
MANUFACTURERS

A PRODUCT SECTION OF
THE MATERIAL HANDLING INSTITUTE, INC.
1326 FREEPORT ROAD
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7/82 5M

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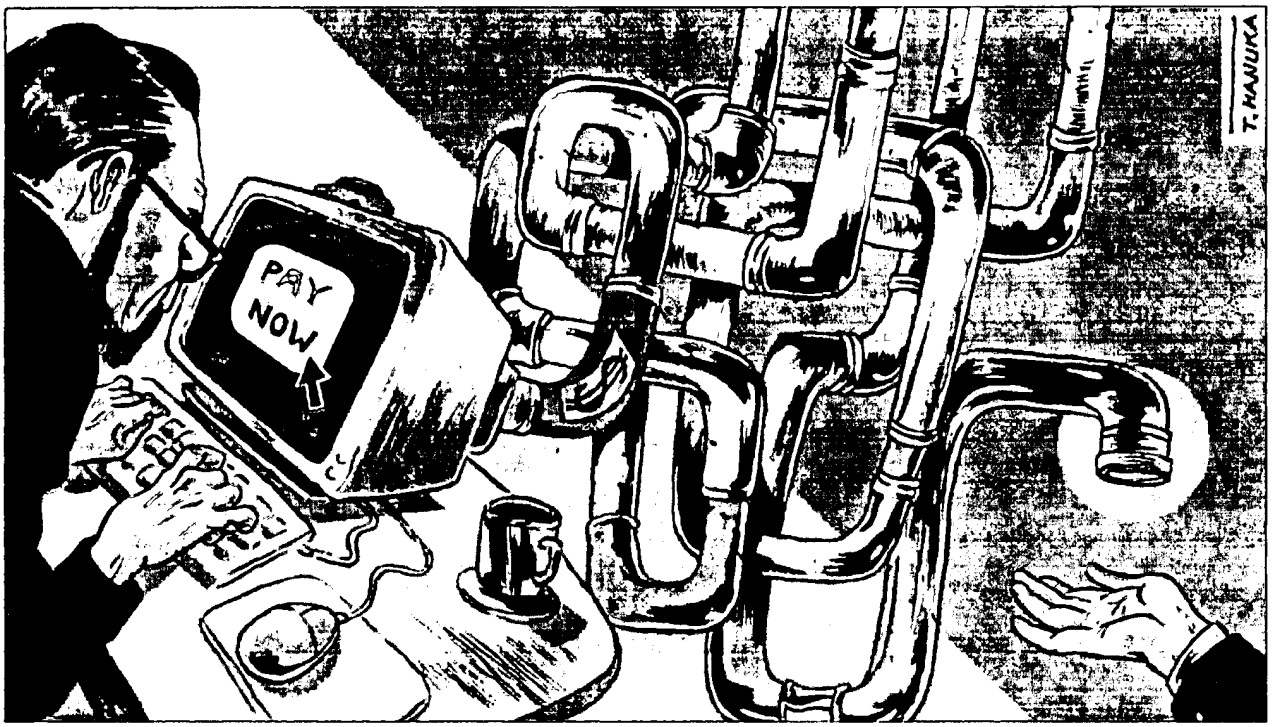
ATTACHMENT TO AMENDMENT A

"HIGH FINANCE, DOWN AND DIRTY"



High Finance, Down and Dirty

Are you expecting your electronic bills to be paid instantly? Don't bank on it.
By Chris O'Malley – December 2001 Popular Science

The check's in the mail, and that's precisely the problem. I didn't write a check to my lawn guy. I paid him electronically, via my computer. But somehow, despite my fancy Quicken software and my bank's fancy online bill-paying service, my lawn guy doesn't get paid until four or five days later, when an old-fashioned paper check shows up in his mailbox.

I know exactly how this happens, because it's been happening for more than five years now to people I pay electronically. The dirty little secret of online banking and bill-paying schemes is that they're little more than high-tech facades for backwater, paper-pushing systems that haven't changed much in decades. So-called electronic payments get converted into paper checks and mailed via the U.S. Postal Service. So-called electronic money transfers take one or more business days, compared with the instant transfers you can usually make at an ATM. And forget about getting any form of money from your PC.

Admittedly, some of this inelegant blending of old and new worlds simply offends my high-tech sensibilities. Now that we're in the 21st century, I think the "checks" I write on my computer and transmit via the Internet ought to represent monies being transferred immediately and directly into other bank accounts, not a print job for some sort-and-stuff clearinghouse. I should be able to move money and get money at my PC more quickly than I could by driving to

the bank or an ATM. After all, what's the point of being electronic if it's slower?

Well, there is some point to it. There's the convenience of not having to write checks and stuff envelopes, a process that used to take me an hour each week. Now it takes about 10 minutes. There's also the convenience and cost saving of not having to run out and buy stamps and stick them to my bills. That alone more than pays for the $10 monthly fee my bank charges for online bill paying. Then there's the peace of mind that comes with always having an up-to-date, reconciled check ledger in front of you. I haven't had to balance a checkbook or review a bank statement since the early 1990s. And I am grateful.

But there are still occasions when my backward banking system reminds me that what's needed is less gratitude and more prodding. For all of its convenience, this system demands that I pay my bills more quickly, lest I be hit with a $60 late charge (and perhaps a smudge on my credit) because my mortgage check arrived a day late. And this despite the fact that I sent it via the Net five days before the deadline. Had I mailed a paper check myself, or walked into a nearby bank branch, that same payment would have been on time. This is progress?

There *are,* however, signs of modern life in the banking and billing systems. Some of the larger companies I write checks to - American Express, Exxon, and Sears, for example - now accept at least quasi-electronic payments, so the delay is down to a day or two (why it still takes that long, however, I'm not sure). But for the majority of people and businesses I pay, it still takes a paper check and a mail truck for them to get their money.

How about a national or even international billing system with a unique ID for every payer and payee, so I can pay anyone, large or small, electronically? How about a banking system that lets me move money instantly and updates my accounts in real time rather than once a day? How about the ability to print secure and verifiable bank checks at home? Or download money to fast-food-friendly and vending-machine-viable cash cards?

The banks do not entirely control their own fate here. To some degree, they play by the monetary rules set forth by governmental entities such as the Treasury Department and the Federal Reserve. But neither have the banks been very aggressive about pushing through reforms that would modernize the way money changes hands between consumers, creditors, and banks. In fact, the only new wrinkle is the emergence of third-party services, such as Pay-trust, that convert incoming paper bills to digital invoices and then let you pay them electronically (with the same limitations). But digital billing solves a problem that most people don't perceive as such—only 17 percent of people even want digital bills, according to a recent Gartner study.

All of this, by the way, stands in stark contrast to the virtual revolution that's occurred with online investing. I get real-time stock quotes on my PC, perform nearly real-time trades, and move money between accounts freely. But the investment firms are motivated: More trading is more money for them. Not surprisingly, government agencies and banks (which often act like government agencies) don't seem as motivated. With so many personal conveniences and business efficiencies at stake, and with the electronic economy at hand, that lack of foresight is alarming.

Banks and government agencies are famously cautious about new technologies. And there are always risks. But c'mon already. The Western world is moving briskly along the information highway. I'd like my money to come along for the ride.

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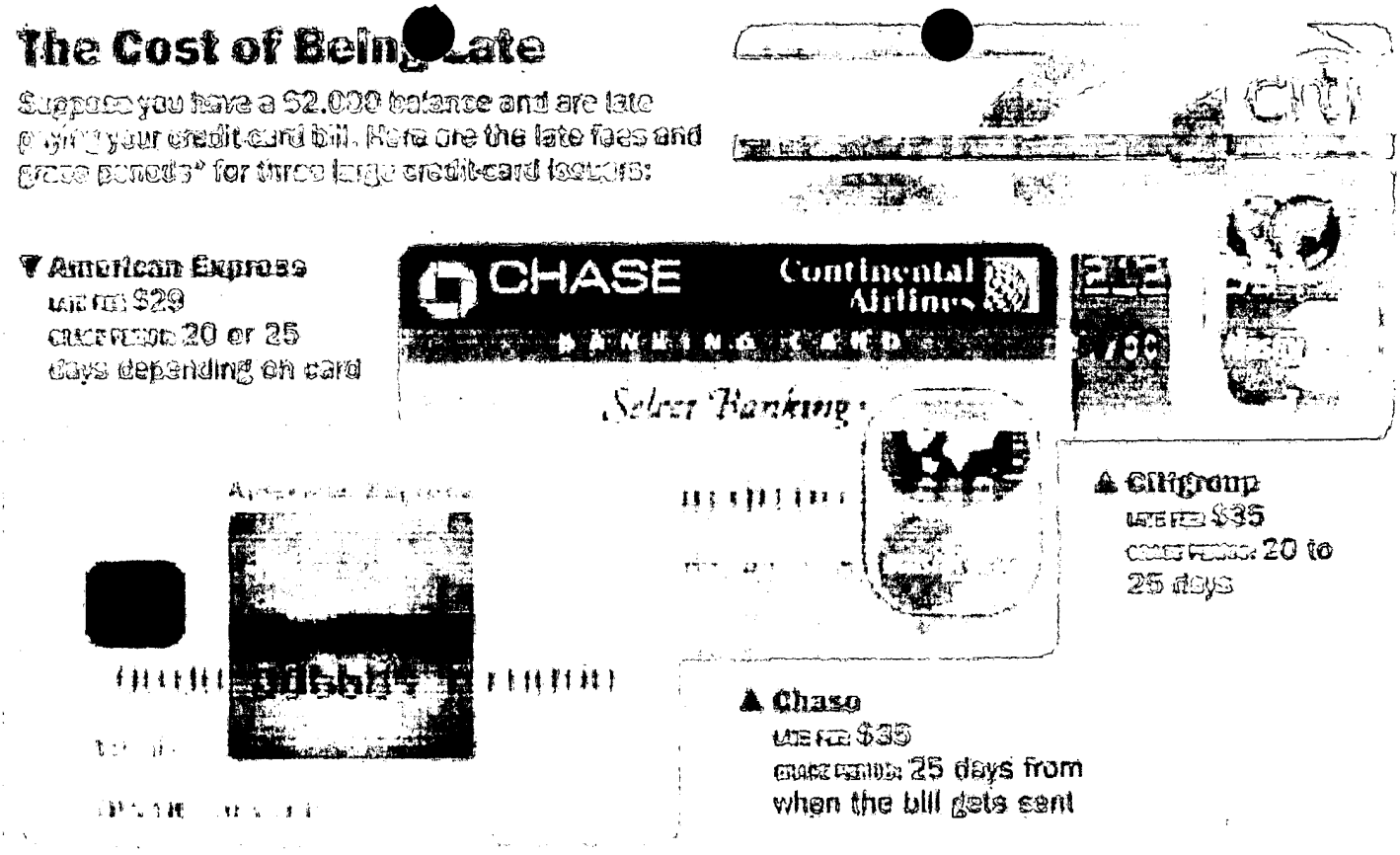
ATTACHMENT TO AMENDMENT A

"CREDIT-CARD FIRMS COLLECT RECORD LEVELS . . ."



Credit-Card Firms Collect Record Levels of Late Fees

New Shorter Grace Periods, Tighter Rules Boost Profits; How to Avoid Getting Hit

By RON LIEBER – WALL STREET JOURNAL – 5/21/02

More people are getting socked with late fees on their credit cards, and the card issuers couldn't be happier about it.

In a sign of just how much credit-card companies are squeezing customers, annual late-fee revenue for the industry has jumped to a record $7.3 billion from $1.7 billion in 1996. And more cardholders are getting hit: About 58% of them had to pay a late fee during the past year, according to a study from CardWeb.com, an Internet site that tracks the credit-card industry. In all late fees represent the third-largest revenue source for card companies, behind interest payments and fees from merchants that accept the cards.

"The sloppy payer is one of the issuers' favorite customers," says Michael R. Dean, a senior director at Fitch Inc., a ratings agency.

Much of this is being accomplished through a one-two punch of higher fees and shortened grace periods, the amount of time between the end of the billing cycle and the payment due date. The average grace period is now 21.2 days, down from 29.7 days in 1990, according to CardWeb.com. (By law, grace periods can't be any fewer than 14 days.) Most card companies say they send the bills out as soon as the billing cycle closes, though of course the actual timing fluctuates with the mail.

In recent months, many of the big companies have also boosted late fees for big chargers. The card companies accomplished this by moving to a three-tiered fee structure: The higher the balance, the more you pay. This month, for instance, Chase started charging a $35 late fee for balances greater than $1,200. Below that level, the late fee is either $29 or $12 if your balance is extremely small. Previously, Chase charged a $29 fee no matter what the balance.

Even the definition of "late" is in flux. At Chase, payments are due at noon on the due date listed on the bill, but the company generally will let it slide for people who are just a day behind. MBNA has a similar leniency period. American Express wouldn't specify its leniency period. but cardholders may be able to get away with being a day or two late.

Many customers nonetheless manage to blow the deadline. In its most recent quarterly earnings announcement, Morgan Stanley crowed about fee income from its credit-card services unit, which includes the Discover Card. The company specifi
cally cited late charges as one of the factors driving a 9% increase in merchant and card-member fees.

The card companies say they prefer that people pay on time and aren't intentionally making that harder. Indeed, American Express says it gives its best rates to the people who meet the deadlines. "The reality is that we need to encourage people to pay us back on time, and the existence of a late fee is to give that kind of encouragement," says a spokeswoman.

Still, there is no question higher fee income is often a good thing for the companies. While charge volume and the number of cards in circulation have risen over the years. the industry has other problems. During the past several years, increased competition has made it harder for them to charge annual fees. In addition, as interest rates have declined they haven't been able to collect as much money
from customers who use their credit cards to borrow.

Another issue for the industry: Bankruptcy filings are at an all-time high, wiping out the balances of many delinquent card holders.

For procrastinators, the card companies have come up with a number of solutions. If you call and ask, some credit-card issuers will change your due date to line it up with your other bills. The only catch: It sometimes requires a change in your credit-card number.

Last-Minute Fix

American Express lets consumers call up the 800 number on the back of their cards and dictate the check number and bank routing number off the bottom of their check in order to transfer the money electronically. The service is free at American Express, though it generally costs between $10 and 815 to pay other issuers this way.

Robert McKinley, chief executive of' CardWeb.com, suggests people might want to send in at least the minimum payment as soon as they receive their bill. This is important, he says, because technically the card companies can put a black mark on your credit record if you pay your bill a few days late.

For people with good credit histories, it is often possible to jawbone card companies into waiving the fee. Daniel Hank, a TV producer, pays his bills in full and on time, but mail delays and other snafus occasionally leave him saddled with a late fee anyway. He calls, notes his excellent payment record and asks them to cut him some slack. "Sometimes it takes the cajoling of a supervisor," he says. "But I've never paid a fee yet."

Main Independent Claim:

A bill payment system comprising:

a biller generating at least one invoice for at least one customer, said invoice comprising a unique bar code not necessarily in a biller designated customer account encoding region, and that can be disambiguated from a plurality of bar codes that may be printed or appear on the invoice for a variety of different useful processing purposes, said bar code comprising data identifying at least said customer and said biller; and

a scanning apparatus configured to scan said bar code, said scanning apparatus be capable, based on the identifying data of said bar code and a payment made by said customer, of concurrently transmitting or initiating transfer of funds to said biller in a predetermined amount and transmitting or initiating coincidental transfer of data to said biller regarding said payment ~~via the Federal Reserve ACH Network~~, and

the bill paying customer does not have to be preregistered ~~to~~, be a subscribed member of or belong to an electronic bill presentment / bill payment system and does not have to divulge any personal financial information, in the form of checking account numbers, debit card account numbers or credit card account numbers, to the payment network or destination biller for payment use, and

wherein said data comprises the date, time and place said customer makes said payment.

New Dependent claims:

A bill payment system according to claim xx, wherein said data incorporates a format designator in which an orthogonal attribute defines a biller designated invoice publication date that expires after a predefined period of time.

A bill payment system according to claim xx, wherein said data incorporates a format designator in which an orthogonal attribute defines a biller designated invoice expiration date, after which the invoice is no longer valid.

A bill payment system according the claim xx wherein said biller recognizes the customer payment date and time as the creditor date of receipt as specified in the Federal Reserve Regulation Z, Section 226.10.

One Step claim
A method of performing a financial transaction in a network, said method comprising the step of: in an electronic funds transfer, inserting one or more data elements comprising the place, date and time of payment is made into the combination of the customer name field and any user designated discretionary fields that may exist in the formal data format specifications of remitted payment records belonging to a payment network.

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ATTACHMENT TO AMENDMENT A

"PUBLICATION 25 CHAPTER 4"

Designing Letter and Reply Mail

Publication 25, March 2001

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4 POSTNET Barcodes

Overview

In Chapter 3, you learned that proper address information is important and that an incorrect address may mean that the piece will not be delivered or will create a negative response to your message.

In this chapter, you will learn about barcoding. Barcoding is also an important aspect of mailpiece design.

Because there are no MLOCR readability requirements for barcodes, you have more latitude in selecting colors, type styles, and the location for address printing if you barcode your mail.

To receive automation discounts, your letter-size mailings must be 100 percent delivery point barcoded. Nonbarcoded pieces enter the same mailstream as a nonautomation presorted mailing.

Description and Benefits

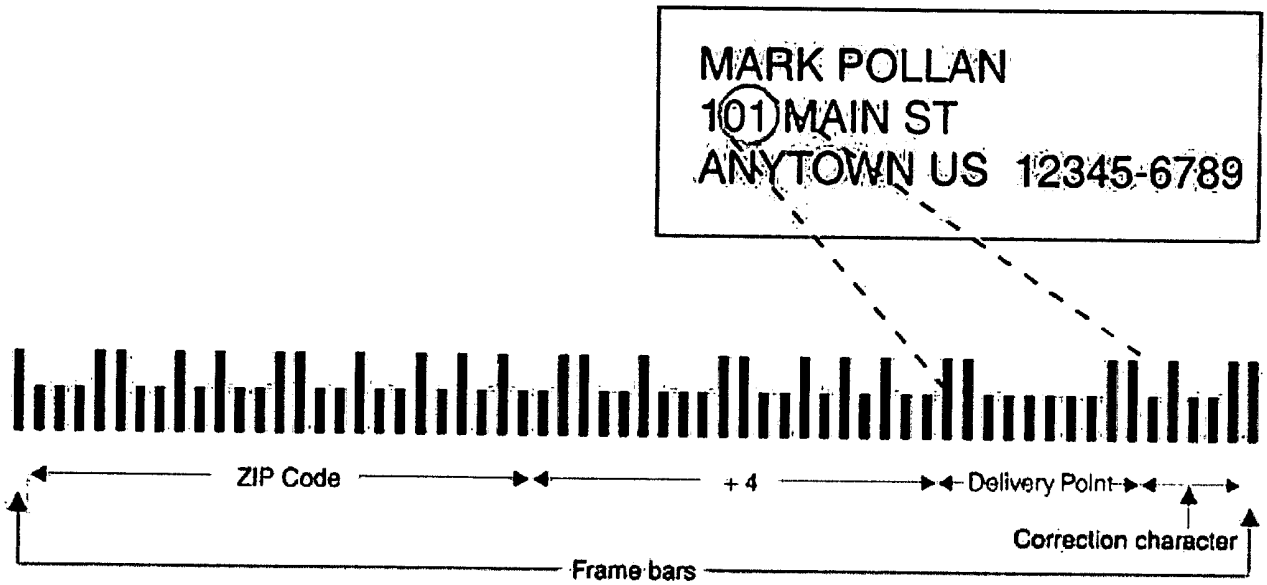
The POSTNET (POSTal Numeric Encoding Technique) barcode was developed by the Postal Service to encode ZIP Code information on letter mail for rapid and reliable sorting by BCSs. The POSTNET barcode can represent a five-digit ZIP Code (32 bars), a nine-digit ZIP+4 code (52 bars), or an eleven-digit delivery point code (62 bars).

Delivery Point Barcode

The delivery point barcode (DPBC) was developed by the Postal Service to identify each of the 134 million delivery points in the United States. This barcode system significantly reduces the time it takes carriers to sort letter mail before delivery.

The DPBC is formed by adding 10 bars to an existing ZIP+4 barcode (see Exhibit 4-1). The 10 bars represent two additional digits (normally the last two digits of the street address, post office box, rural route number, or highway contract route number). DMM C840 contains address coding rules for the DPBC, including rules for handling address anomalies.

Exhibit 4-1
Delivery Point Barcode



POSTNET Format

Description

The POSTNET barcode is always printed in a format that begins and ends with a frame bar (full or tall bar). To ensure POSTNET accuracy during mail processing, a correction character (five bars) must be included immediately before the rightmost frame bar of all POSTNET barcodes (see Exhibit 4-3).

The correction character is always the digit that, when added to the sum of the other digits in the barcode, results in a total that is a multiple of 10. For example, the sum of the ZIP+4 barcode 12345-6789 is 45. The next higher multiple of 10 is 50, so the correction character is 5 (50 minus 45).

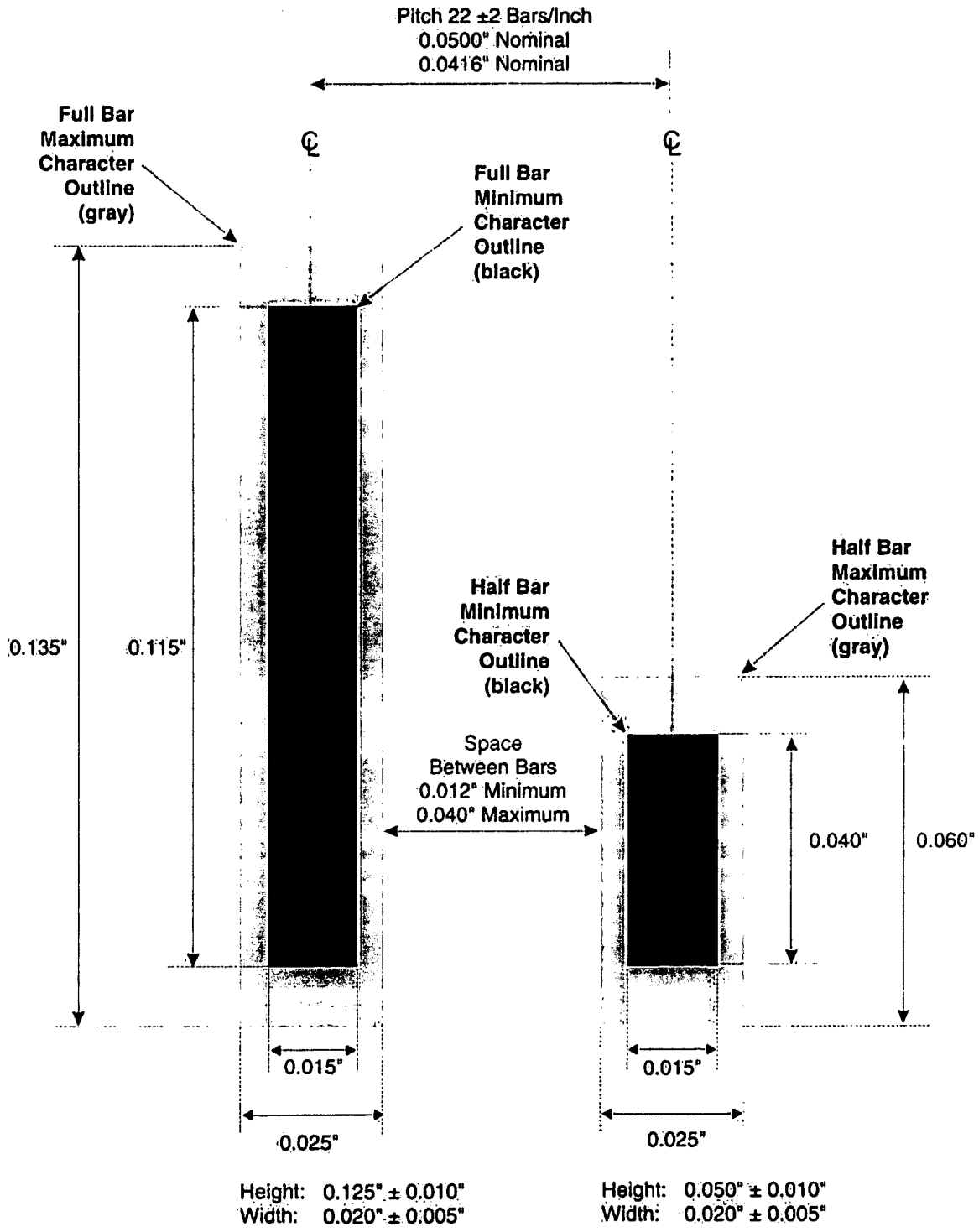
Nine-Digit ZIP+4 Code (52 Bars)

The distance from the leading edge of the first (leftmost) bar to the leading edge of the fifty-second (rightmost) bar should be at least 2.125 inches. The distance from the leading edge of the first bar to the trailing edge of the fifty-second bar should not exceed 2.575 inches. ZIP+4 barcodes are used only with reply mail letter-size pieces.

Eleven-Digit Delivery Point Code (62 Bars)

The distance from the leading edge of the first (leftmost) bar to the leading edge of the sixty-second (rightmost) bar should be at least 2.540 inches. The distance from the leading edge of the first bar to the trailing edge of the sixty-second bar should not exceed 3.075 inches (see Exhibit 4-2 for general specifications).

Exhibit 4-2
POSTNET Barcode Specifications
(not drawn to scale)

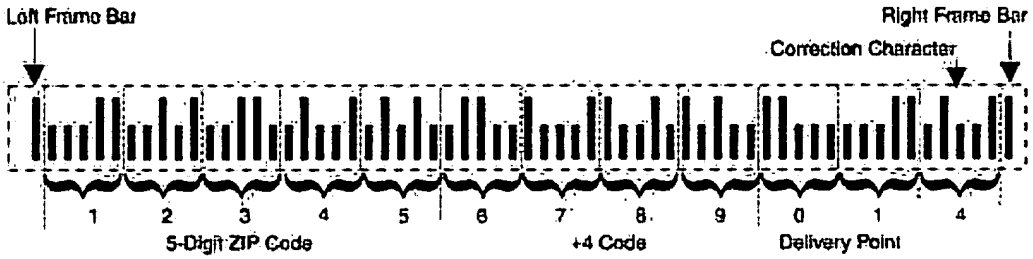


Decoding POSTNET Barcodes

The first and last full bars in a barcode—the frame bars—do not count. Each digit (numeric value) of the ZIP Code or ZIP+4 is represented by five bars.

The last five bars in the barcode make up the correction character. All barcodes, when added together, must equal a multiple of 10. Exhibit 4-3 shows a barcode decoded using the POSTNET code.

Exhibit 4-3
Delivery Point POSTNET Format
(not actual size)



Code Elements

The basic elements of the POSTNET barcode are binary digits, represented as full bars and half bars (or tall bars and short bars). A full bar represents "1" (one) and a half bar represents "0" (zero) (see Exhibit 4-4).

The geometry of the bars and their proper location on letter mail are covered in the following sections and exhibits.

Exhibit 4-4
Code Elements

Numeric Value	Binary Code Value 74210	Barcode Value 74210
1	00011	
2	00101	
3	00110	
4	01001	
5	01010	
6	01100	
7	10001	
8	10010	
9	10100	
0	11000	

Code Characters

Each code character is made up of five bars, which together represent a single numeric digit. Specific combinations of two full bars and three half bars represent the digits 0 through 9. Only the 10 combinations shown in Exhibit 44 are valid code characters—they represent all possible combinations of two full bars and three half bars.

These combinations are central to the error-recovery of POSTNET because the system interprets as an error the combination of five bars containing other than two full and three half bars.

Bar Position Weights

Except for zero, the numeric value of each valid combination of five bars can be determined by adding the "weights" of the two positions occupied by the full bars ("1s"). From left to right, the bar positions are weighted 7, 4, 2, 1, and 0 (see Exhibit 4-4).

For example, the combination 01010 contains a full bar in the second position (weight 4) and in the fourth position (weight 1). Adding 4 and 1 yields 5—the assigned value of this combination. The only exception is the combination 11000, which has a total weight of 11 but is assigned a value of zero.

Bar Spacing (Pitch)

Horizontal Spacing

The nominal horizontal spacing (pitch), defined as a bar and a space, must be limited to 22 bars (±2 bars) per inch when measured over any $^1/_2$-inch portion of the barcode. The horizontal spacing at 24 bars per inch is 0.0416 inch and, at 20 bars per inch, is 0.050 inch. Between individual bars, there should be a clear space of at least 0.012 inch, but not more than 0.040 inch.

The dimensions described below should be maintained for eleven-digit POSTNET barcodes so that our BCSs can accommodate the tolerances encountered with different printing technologies.

Barcode Locations

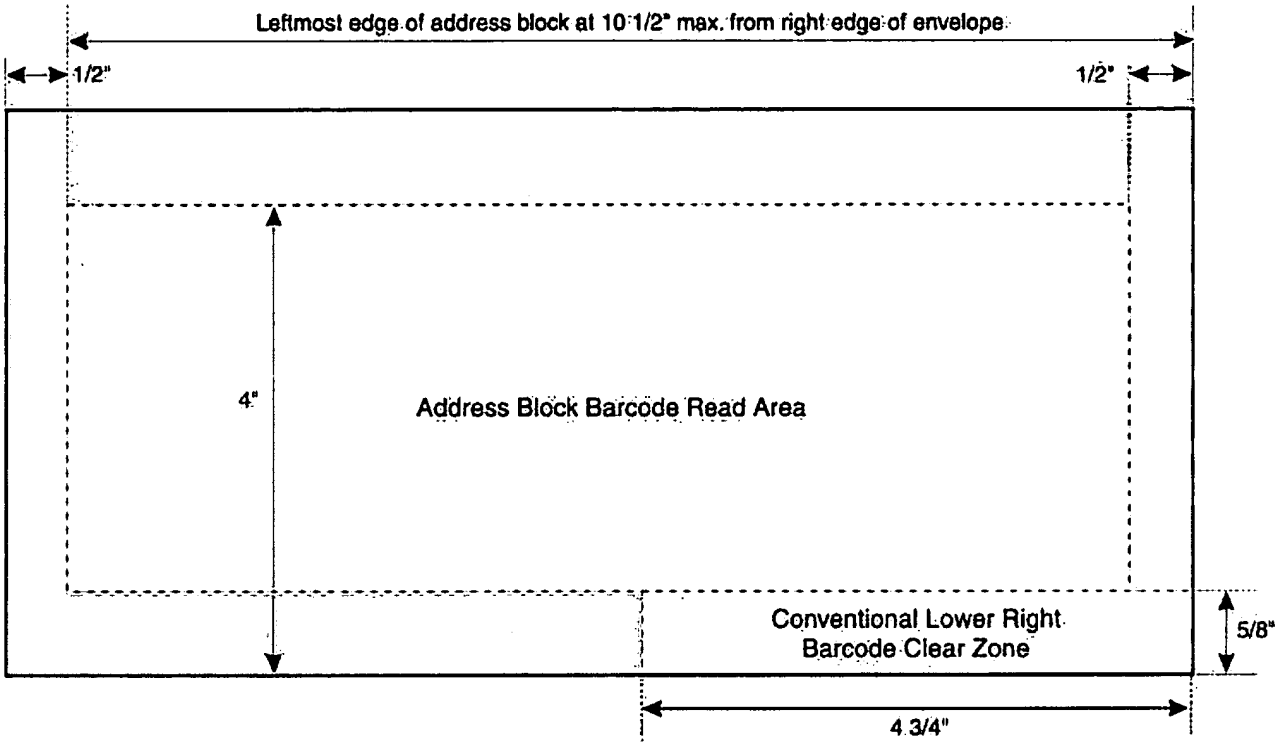
Placement

If you apply the POSTNET barcode to your outgoing letter mail, you may print the barcode in the lower right corner or as part of the address block (see Exhibit 4-5).

MLOCR-applied barcodes are always printed in the lower right corner of the mailpiece.

Exhibit 4-5

Barcode Placement Areas
(not drawn to scale)



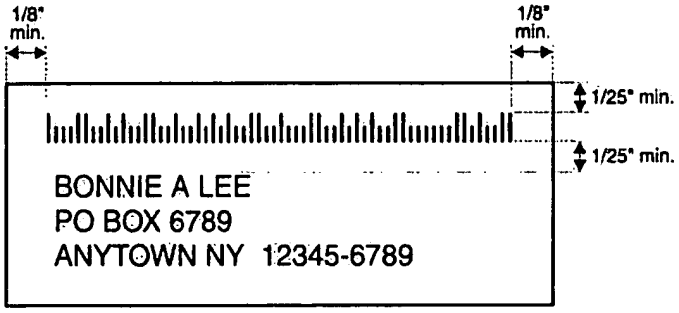
Address Block

You may choose one of the following four locations for the POSTNET barcode if you print it in an address block (see the corresponding examples in Exhibit 4-6):

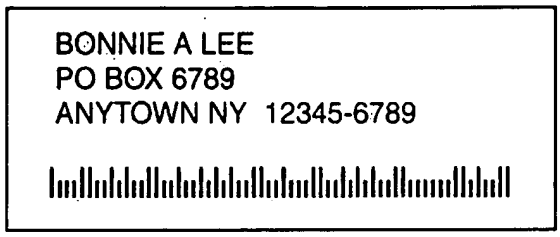
- **A. Immediately above the recipient line.**
- **B. Immediately below the city, state, and ZIP Code line.**
- **C. If a keyline or optional endorsement line is used, above the recipient line but below the keyline and optional endorsement lines.**
- **D. If a keyline or optional endorsement line is used, immediately above the keyline and optional endorsement lines.**

Exhibit 4-6
Address Block Barcode Placement Options
(not drawn to scale)

Example A Example B

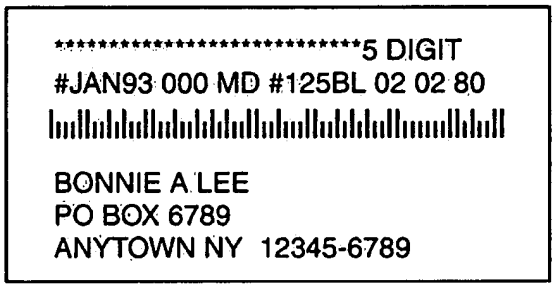


Above Address (Preferred)



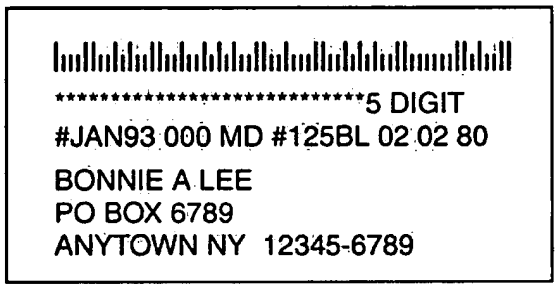
Below Address (Acceptable)

Example C



Below Optional Endorsement Line and/or Keyline Information (Preferred)

Example D



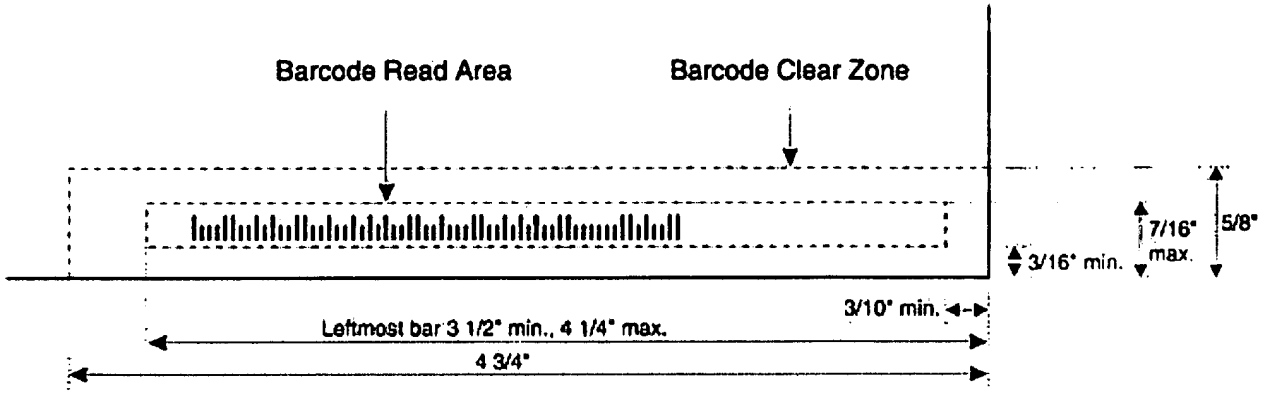
Above Optional Endorsement Line and/or Keyline Information (Acceptable)

You may not apply the POSTNET barcode anywhere between the recipient line and the city, state, and ZIP Code line of the address (that is, do not place the barcode between any lines of the delivery address). Chapter 2 provides specifications for the clearance needed between address block barcodes and window edges, inserts, address labels, and other nonaddress printing.

Conventional Lower Right Corner

Delivery point barcodes printed in the lower right corner of letter mail must be positioned to meet the specifications shown in Exhibit 4-7. The first (leftmost) bar of the barcode should appear between $3^1/_2$ inches and $4^1/_4$ inches from the right edge of the mailpiece.

Exhibit 4-7
Lower Right Corner Barcode
(not drawn to scale)



Barcode Layout

Bar Tilt

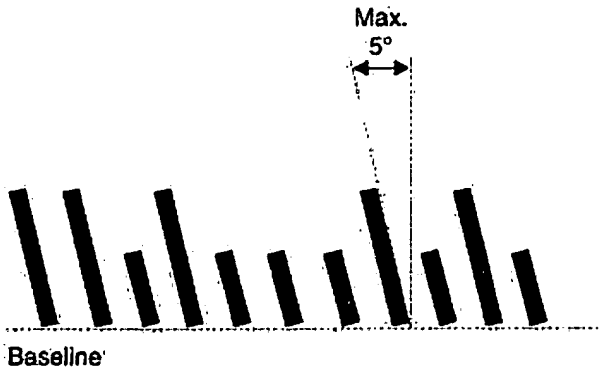
Two types of tilt can occur when printing POSTNET barcodes on a mailpiece (see Exhibit 4-8):

Bar rotation, in which the individual bars are tilted (not perpendicular) with respect to the baseline of the barcode.

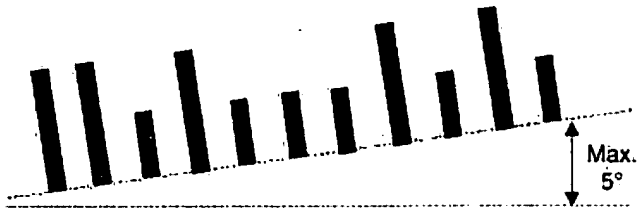
Pattern skew (or slant), in which the entire barcode is tilted with respect to the bottom edge of the mailpiece.

Both types of tilt can occur simultaneously. Because BCSs read barcode bars individually, these sorters cannot determine which type of tilt is present. Consequently, total bar tilt should be measured with respect to a perpendicular from the bottom edge of the mailpiece. The combined effects of pattern skew and bar rotation must be limited to a maximum tilt of 5 degrees.

Exhibit 4-8
Bar Tilt
(not drawn to scale)



Bar Rotation



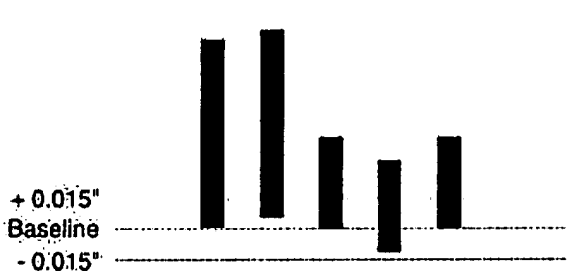
Pattern Skew

Combined Tilt

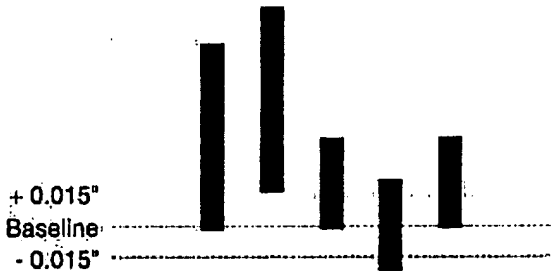
Baseline Shift

The vertical position of adjacent bars must not vary more than 0.015 inch from bar to bar when measured from the baseline (bottom) of the barcode (see Exhibit 4-9).

Exhibit 4-9
Barcode Baseline Shift
(not drawn to scale)



Acceptable Baseline Shift



Unacceptable Baseline Shift

Barcode Printing

Background Reflectance

The area of the mailpiece where the barcode is to be placed (address block or lower right corner) should be uniform in color and produce a minimum reflectance of 50 percent in the red portion and 45 percent in the green portion of the optical spectrum, when measured with a USPS envelope reflectance meter or its equivalent.

Although a white background is preferred, pastels and other light colors are acceptable. The mailpiece should not be fluorescent or phosphorescent because the glow can cause

malfunctions during mail processing.

Print Reflectance Difference

The BCS responds to the difference between light reflected from the printed barcode and the background. This difference is defined as print reflectance difference (PRD). A PRD of at least 30 percent in the red and the green portions of the optical spectrum is necessary for reading POSTNET barcodes. Like print contrast ratio (PCR), PRD can be measured with a USPS envelope reflectance meter or its equivalent (see Appendix A).

As with MLOCRs, BCSs respond best when the barcode is printed in black ink on a white background. Other color combinations are acceptable if the minimum PRD of 30 percent exists for the printed barcode. Refer questionable color combinations to your mailpiece design analyst for testing.

Overinking

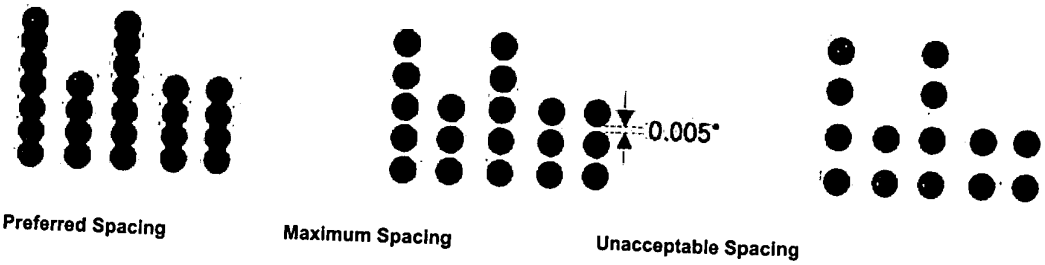
Overinking, which causes any bar to exceed its maximum dimensions, can prevent the BCS from successfully interpreting the barcode (see Exhibit 4-10). Consequently, make sure that ink coverage does not cause any bar to exceed the height or width limitations.

Exhibit 4-10
Overinking (Extraneous Ink)
(not actual size)

Voids

A void, which reduces any bar to less than its minimum dimensions, can prevent the BCS from successfully interpreting the barcode. In Exhibit 411, a malfunctioning dot matrix printer created the voids. Ideally, dot matrix printing should yield dots that touch or overlap. If the dots are not touching, the space between the dots should not exceed 0.005 inch.

Exhibit 4-11
Voids
(not drawn to scale)



Extraneous Matter

Background patterns, envelope insert "show-through," and any other printing within the clear

areas surrounding the barcode (lower right corner and address block areas shown in Exhibit 45) should be limited to a maximum PCR of 15 percent in the red and the green portions of the optical spectrum. A PCR exceeding 15 percent can interfere with barcode recognition.

Barcode Software and Hardware Certification

To help mailers evaluate the quality of their barcode-producing equipment, the Postal Service offers optional testing and certification to manufacturers of barcoding software and hardware. Certifying the barcoding equipment ensures that it can produce dimensionally correct barcodes that meet postal specifications.

Certification does not ensure that the barcodes produced from that equipment will meet the requirements for automation rates because many other variables (such as ink color and quality, paper color and contrast, and equipment operation and maintenance) affect the quality of the printed barcodes.

Manufacturers who want their products tested and mailers who want information on available certified products should contact the National Customer Support Center at 1-800-238-3150 or www.usps.com/ncsc.

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